

# Smooth ride at 300 km/h

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Caterham F1 Team's space-damped racing car.

Serious shocks need serious shock absorption, in space as well as on the ground. Now high-performance racing cars are driving more smoothly on space-ready rubber from ESA spacecraft.

Toulon-based French company SMAC specialises in finely tuned rubber formulations that cushion sensitive machinery everywhere, from [space](#) to the racetrack.

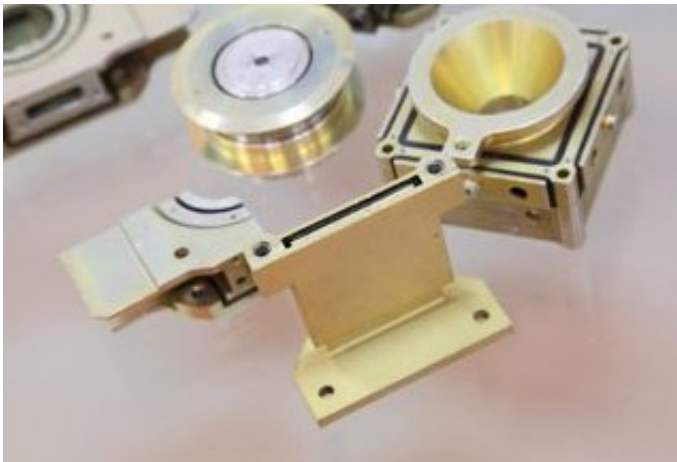
"They're very high-damping materials," says CEO Philippe Robert.

"They have been used in everything from [space missions](#) to aeronautics and even auto racing."

In space, special SMAC materials are used to reduce pyrotechnic shocks – basically, the explosions that jolt a satellite when it's launched atop a rocket or when explosive couplings release.

"When you have pyro-bolts or any pyrotechnic device, they create a lot of energy in a very short time," Philippe says. "Engineers are concerned you could break sensitive items with a high-frequency shock."

Another way the special materials are used in orbit is to eliminate the tiny vibrations caused by a satellite's moving parts. Such vibrations might throw off the measurements of a sensitive device or result in blurry images of the cosmos.



Smactane damper.

"If you have very high-accuracy cameras, you don't want them disturbed

by the vibrations from electric motors," Philippe says.

ESA has worked with SMAC to develop damping technology for the Agency's Expert reentry test craft and the [solar array](#) of the Automated Transfer Vehicle responsible for resupplying the [International Space Station](#).

"Expert used the anti-vibration mounts or dampers on three different sets of equipment: the inertial measurement unit, the power control and distribution unit, and the beacon," notes Anthony Thirkettle, Expert Principal [Mechanical Engineer](#) in ESA.

"They reduce the [mechanical loads](#) coming from the launcher to levels that the equipment was designed and qualified for."



ATV-3 approaches Space Station.

## Space expertise improves car performance

Based on the knowhow from developing Smactane certified by ESA for use in space, the company has produced other rubber materials for non-space applications.

Smacumb is being used to rocket Formula 1 cars along the world's racetracks. The exact composition of both types, Philippe says, is proprietary.

The 650 kg high-performance machines sometimes drive 800 km in a race weekend, exceeding 300 km/h. The high stresses and speeds also make them ideal testbeds for any high technology, including the materials developed by SMAC.

"With our rubber parts, they get better performance and better tuning," Philippe says. "It's costly, but it appears it is a very important part in terms of the handling of the car."

Provided by European Space Agency

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